

REMARKS

Claims 1-20 are pending in the application.

Claims 1-13 and 18-20 are rejected.

Claims 14-17 are withdrawn.

No claims are amended.

CONSTRUCTIVE ELECTION BY EXAMINER

37 CFR 1.142 states that a requirement for restriction may be proper where two or more independent and distinct inventions are claimed in a single application.

On page 2 of the October 16, 2007 Office Action, the Examiner indicated that claims 14-17 are directed to an invention that is independent or distinct from the invention originally claimed on the basis that claim 14 comprises a scanner configured to scan an image at a scanned image level and a processor.

Applicant respectfully submits that the reasons provided for withdrawing the claims do not meet the requirements of 37 CFR 1.142 nor do they meet the USPTO's own guidelines that include two criteria for a proper requirement for restriction between patentably distinct inventions, and a reason to support the conclusion (MPEP 803 sections I and II). The criteria include: (A) The inventions must be independent or distinct as claimed; and (B) There would be a serious burden on the examiner if restriction is not required.

Accordingly, Applicant respectfully requests that the Examiner point out with specificity why the claims sets are independent or distinct, so that Applicant may be able to determine the species/groups that might be claimed in a divisional application.

Rejection of Claims 1-13 and 18-20 – 35 U.S.C. § 103

Claims 1-13 and 18-20 are rejected under 35 USC §103(a) over Tenze (US 6,819,804) in view of Accad (US 5,553,200).

The rejection is traversed.

Tenze describes a method of identifying a type of noise in a digital image, and selecting a noise filter that corresponds to the identified type of noise (column 1 lines 37-43).

Accad describes a method for providing bit-rate reduction and reconstruction of image data. Dither arrays are used to reduce the number of bits of the image data, and threshold arrays are used to perform de-dithering correction of the reconstructed image (column 15 lines 18-35).

Tenze and Accad, even if combinable, fail to disclose the features recited by claims 1-13 and 18-20. For example, claim 1 recites a method for reducing image noise in a scanned image, comprising:

decreasing a color level of the scanned image by reducing a number of bits of a full color level of one or more pixels in the scanned image to form a reduced color level image;

composing a pattern having less color level than the full color level; and
recombining the full color level of the one or more pixels in the scanned image by combining the reduced color level image with the pattern.

The Examiner identifies column 1 lines 20-22 and 35-45, and column 3 line 64 to column 4 line 29 as disclosing as disclosing the features recited by claim 1 of decreasing a color level of the scanned image by reducing a number of bits of a full color level of one or more pixels in the scanned image to form a reduced color level image. Tenze is not concerned with decreasing a color level of a scanned image, nor of color in general. The word color is not even referenced in Tenze. Rather, the noise that is referred to in Tenze is directed to sensor noise or video noise that is identifiable as Gaussian noise, contaminated Gaussian noise and long-tailed noise (col. 3 lines 64-67).

Tenze compensates for the noise according to whether or not they appear in a homogenous region or at an edge of an image (col. 4 lines 22-29). A color level of the image is not discussed or referred to by Tenze. The mere reference to a selection of a filter does not suggest that a filter operates by decreasing a color level of the scanned image by reducing a number of bits of a full color level of one or more pixels in the scanned image to form a reduced color level image. The Gaussian, contaminated Gaussian and long-tailed types of noise described by Tenze describe a distribution or structure of the noise, not a number of bits of a color level.

The Examiner further identifies column 1, lines 35-45 as disclosing the features of composing a pattern having less color level than the full color level. The ability to identify and filter out different noise types, as described by Tenze, is unrelated to composing a pattern. Furthermore, the Examiner has failed to identify with any specificity what element of Tenze equates to “the pattern” as recited by claim 1, and for that matter, what element is “the reduced color level image.” The Examiner appears to be suggesting that the Tenze filter that operates to remove noise from a digital image somehow both forms a reduced color level image and composes a pattern having less color level than the full color level. This is not supported by Tenze. Even if for the sake of argument the operated image disclosed in Tenze equates to a reduced color level image, Tenze fails to disclose the pattern recited in claim 1.

The Examiner acknowledges on page 3, second full paragraph that Tenze does not disclose recombining a full color level of one or more pixels in a scanned image by combining a reduced color level image with a pattern. Instead, the Examiner cites a dither array of Accad at column 15, lines 15-51. Applicant respectfully submits that Accad has been misinterpreted by the Examiner.

The dither array of Accad is described as being used to create a bit-rate reduced image (col. 15 lines 15-32). The threshold array is described as being used to reconstruct the image (col. 15 lines 32-41). Accad does not disclose combining a reduced color level image with a pattern, as recited in claim 1.

Accad also fails to cure the further deficiency of Tenze, in that Accad also does not disclose the pattern recited by claim 1. The threshold array of Accad is not a pattern having less color level than a full color level, rather it is an array of correction values R'' that is applied to the coded image $C(i, j)$ to produce a dequantized array (col. 15 lines 35-37).

At least for these reasons, the rejection of claim 1 is traversed. Withdrawal of the rejection is respectfully requested. Claims 2-5 and 7 depend from claim 1. For at least this reason, these claims are also in condition for allowance.

With regards to claim 3, the Examiner states that Accad discloses combining the reduced color image with the pattern to restore the one or more pixels to include a same number of bits as before the color level is decreased. However, per the citation provided by the Examiner at column 15 lines 45-51, it is clear that the reconstructed value of Accad is in fact 280.5 which is greater than the highest level (255) available for an 8-bit color space. Clearly then, even if for the sake of argument the threshold array were to describe the pattern of claim 1, it would still fail to disclose the method recited by claim 1, wherein combining the reduced color level image with the pattern restores the one or more pixels to include a same number of bits as before the color level is decreased. Accad instead teaches that the reconstructed value must be clipped in order to obtain the value of 255 (col. 15 lines 49-51). For at least this additional reason, claim 3 is in condition for allowance.

With regards to claim 4, the Examiner cites column 15 lines 15-24 of Accad as disclosing a pattern comprising a halftone pattern. Applicant respectfully submits that a dithered array, or for that matter a threshold array, does not disclose a halftone pattern. Dithering is used to provide uncorrelated noise in order to remove visual artifacts from an image. While the image that is being operated on may be a halftone image, the array itself is

not a halftone image. As previously described, the arrays provide values that are used to operate on the coded image $C(i, j)$. The Examiner has failed to identify any element of Accad that discloses the pattern recited by claim 4. For at least this additional reason, claim 4 is in condition for allowance.

With regards to claim 5, the Examiner cites column 1 lines 35-45 of Tenze as disclosing a method wherein a number of bits reduced from the full color level is set to an image noise level. The cited reference merely describes that different types of noise may be identified and that a filter may be selected according to the identified noise. Tenze does not disclose that any filter operates on color, let alone a number of bits reduced from the full color level being set to an image noise level. For at least this additional reason, claim 5 is in condition for allowance.

Claims 6, 8-11, and 18-20 include features similar to those discussed above and for at least this reason, are also in condition for allowance.

With regards to claim 10, the Examiner acknowledges that Accad (and presumably Tenze) fail to disclose a halftone pattern comprising a matrix having a number of rows equal to the decreased number of bits. The Examiner further indicates that Applicant has failed to identify where the matrix recited by claim 10 provides an advantage. The Examiner is directed to at least page 6, paragraph 27 of the application for the discussion on the halftone pattern comprising a matrix. As previously discussed, Accad is unable to recombine an image level, and so has to “clip” the correction values during reconstruction of the original image data (col. 15 lines 49-51).

Additionally, the Examiner does not provide any reason as to why someone skilled in the art would modify the cited reference to include a halftone pattern comprising a matrix having a number of rows equal to the decreased number of bits. Instead the Examiner makes an unsupported generalization that one skilled in the art would expect equal performance using dither array or using a matrix having a number of columns equal to the decreased number of bits because both arrays perform the same function. The Applicant respectfully requests the Examiner provide a reference to support this position.

For at least this additional reason claim 10 is in condition for allowance. Claims 11 and 20 include features generally similar to those discussed above with reference to claim 10. For at least this additional reason, these claims are also in condition for allowance.

At least for the above reasons, Applicant respectfully requests withdrawal of the rejection of claims 1-13 and 18-20.

Conclusion

For the foregoing reasons, reconsideration and allowance of all pending claims is requested. The Examiner is encouraged to telephone the undersigned at (503) 224-2170 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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